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Short Report
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What is the Mystery Behind Anosmia and Ageusia in COVID-19?

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Short Report

With the emergence of the new pandemic Coronavirus Disease 2019 (COVID-19) caused by a new strain of coronavirus, named Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2), engagement of new signs and symptoms in medical specialties are gaining importance. Otolaryngology, one of the frontiers in the airway management is not an exception. Otolaryngologists worldwide are engaged in COVID-19 patient management, either through in-patient managing of the airway or out-patient treatment of COVID-19 patients with atypical or mild symptoms.

One of the novel symptoms of COVID-19 encountered in out-patient visits during the pandemic era is anosmia and ageusia. During the previous epidemics with SARS and Middle East Respiratory Syndrome (MERS), not many cases of anosmia were reported, showing different tropism of different strains of *Coronaviridae*, making anosmia and ageusia a common unique feature to the new strain. There are emerging case-series reporting sudden onset anosmia which in some instances are followed by fever or mild respiratory symptoms [1-4]. What is of interest here is that anosmia and ageusia are usually reported in younger cases with mild or moderate severity. In a recent online study conducted in Iran during the epidemics, 48.23% of 10069 participants had anosmia/hyposmia and symptoms such as fever, cough and dyspnea were less prevalent in the patients who experienced anosmia or hyposmia and only about 1.1% of study populations were hospitalized due to respiratory complications [1]. However, due to limited resources and diagnostic guidelines, COVID-19 testing had not been carried out. Another multicenter study on 417 confirmed COVID-19 patients, 85.6% had olfactory dysfunction, with 79.6% being anosmic [5]. Olfactory dysfunction in 11.8% was the initial symptom of infection. 88.8% reported gustatory disorders, consisting of impairment of salty, sweet, bitter, and sour taste modalities. Olfactory dysfunction was not significantly associated with rhinorrhea or nasal obstruction and about 25.5% of patients recovered from both olfactory and gustatory dysfunctions in 2 weeks after the resolution of general symptoms.

Etiology of anosmia still remains to be discovered. There are several proposed mechanisms, from bilateral inflammatory obstruction of the olfactory clefts to targeting or olfactory epithelium supporting cells and not the olfactory sensory neurons [3,6]. However, as the majority of patients with anosmia did not have nasal obstruction or rhinorrhea [5], the obstructive mechanism may not be applicable. Furthermore, as many of the patients with Anosmia have mild symptoms of COVID-19 and even 1 out of 6 have isolated anosmia [4], involvement of olfactory epithelium supporting cells without respiratory tract involvement would be plausible. We propose that a neurotoxic mechanism may be the underlying etiology to anosmia, as the neurologic manifestations of coronavirus is being reported as an extreme to the infection and the olfactory bulb could be the means of entering the central nervous system. Isolated gustatory dysfunction in patients recovered from anosmia further strengthens the hypothesis. Furthermore, a study of patients with post-viral olfactory dysfunction detected Rhinovirus, Coronavirus, Parainfluenza virus, and Epstein-Barr virus in nasal discharge and suggested that rhinoviruses can cause olfactory dysfunction through mechanisms other than nasal obstruction [7].

Identification of new onset Anosmia as one of the primary symptoms of COVID-19 can have many implications. Case identifications may be influenced by acknowledging olfactory dysfunction as one of the symptoms and with availability of abundant diagnostic testing better estimation of prevalence of disease would be available. Patients with new onset isolated anosmia will be advised to

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self-isolate and precautions to be applied when seeking medical care.

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